What is claimed is:

1. An illumination system, comprising:

a light source, wherein said light source further comprises an emitting layer and a reflecting layer, wherein said emitting layer emits light of a first wavelength range and wherein the total light-emitting area of said light source is area A_S;

a wavelength conversion layer, wherein said wavelength conversion layer converts a portion of said light of a first wavelength range into light of a second wavelength range, different from said light of a first wavelength range;

a light-recycling envelope, wherein said light-recycling envelope is separate from said wavelength conversion layer, wherein said light-recycling envelope at least partially encloses said light source and said wavelength conversion layer, wherein the maximum cross-sectional area of said light-recycling envelope is area A_E, wherein said light-recycling envelope has reflectivity R_E and wherein said light-recycling envelope reflects and recycles part of said light of a first wavelength range and part of said light of a second wavelength range back to said reflecting layer or to said wavelength conversion layer as recycled light; and

at least one light output aperture, wherein said at least one light output aperture is located in a surface of said light-recycling envelope, wherein the total light output aperture area is area A_O, wherein said light source and said wavelength conversion layer and said light-recycling envelope direct at least a fraction of said light of a first wavelength range and at least a fraction of said light of a second wavelength range out of said light-recycling envelope through said at least one light output aperture as incoherent light and wherein said recycled light reflected from said light-recycling envelope produces increased light output brightness through said at least one light output aperture.

2. An illumination system as in claim 1, wherein said light of a first wavelength range emitted by said light source has a maximum intrinsic source radiance and a maximum intrinsic source luminance, wherein said fraction of said light of a first wavelength range and said fraction of said light of a second wavelength range exiting said at least one light output aperture have a combined exiting radiance and a combined exiting luminance and wherein said area A_O is less than said area A_S.

3. An illumination system as in claim 2, wherein said combined exiting radiance is greater than said maximum intrinsic source radiance.

4. An illumination system as in claim 2, wherein said combined exiting luminance is greater than said maximum intrinsic source luminance.

5. An illumination system as in claim 1, wherein said light source and said wavelength conversion layer operating in combination have a maximum combined intrinsic radiance and a maximum combined intrinsic luminance, wherein said fraction of said light of a first wavelength range and said fraction of said light of a second wavelength range exiting said at least one light output aperture have a combined exiting radiance and a combined exiting luminance and wherein said area A_O is less than said area A_E.

6. An illumination system as in claim 5, wherein said combined exiting radiance is greater than said maximum combined intrinsic radiance.

7. An illumination system as in claim 5, wherein said combined exiting luminance is greater than said maximum combined intrinsic luminance.

8. An illumination system as in claim 1, wherein said light source and said wavelength conversion layer operating in combination have a maximum combined intrinsic radiance of light of a second wavelength range and a maximum combined intrinsic luminance of light of a second wavelength range, wherein said fraction of said light of a second wavelength range exiting said at least one light output aperture has an exiting radiance of light of a second wavelength range and an exiting luminance of light of a second wavelength range and wherein said area A_O is less than said area A_E.

9. An illumination system as in claim 8, wherein said exiting radiance of light of a second wavelength range is greater than said maximum combined intrinsic radiance of light of a second wavelength range.

10. An illumination system as in claim 8, wherein said exiting luminance of light of a second wavelength range is greater than said maximum combined intrinsic luminance of light of a second wavelength range.

11. An illumination system as in claim 1, wherein said reflecting layer of said light source at is located on an inside surface of said light-recycling envelope.

12. An illumination system as in claim 1, wherein said light of a first wavelength range is greater than 200 nanometers in wavelength and less than 3000 nanometers in wavelength.

13. An illumination system as in claim 12, wherein said light of a first wavelength range is greater than 200 nanometers in wavelength and less than 450 nanometers in wavelength.

14. An illumination system as in claim 1, wherein said light source further emits light of a third wavelength range, different than said light of a first wavelength range and said light of a second wavelength range.

15. An illumination system as in claim 14, wherein said light source emits said light of a third wavelength range concurrently with the emission of said light of a first wavelength range and said light of a second wavelength range and wherein said fraction of said light of a first wavelength range and said fraction of said light of a second wavelength range and a fraction of said light of a third wavelength range exit said at least one light-output aperture as light of a composite color.

16. An illumination system as in claim 14, wherein the amount of said light of a third wavelength range emitted by said light source is changed in order to vary the color and the color-rendering index of said light of a composite color.

17. An illumination system as in claim 14, wherein said light source emits said light of a third wavelength range in a first time period, wherein said light of a first wavelength range and said light of a second wavelength range are emitted in a second time period, different than the first time period, wherein a fraction of said light of a third wavelength range exits said at least one light output aperture in said first time period, wherein said fraction of said light of a first wavelength range and said fraction of said light of a second wavelength range exit said at least one light-output aperture in said second time period and wherein said first time period and said second time period are repeated in sequence.

18. An illumination system as in claim 1, wherein said light source further comprises at least one light guide, wherein said light guide has an input surface adjacent to said emitting layer of said light source, wherein said light guide has an output surface located inside said light-recycling envelope, wherein said light guide transports said light of a first wavelength range from said light source to said light-recycling envelope.

19. An illumination system as in claim 1, wherein said wavelength conversion layer fills a substantial portion of said light-recycling envelope and wherein said wavelength conversion layer covers said emitting layer of said light source.

20. An illumination system as in claim 1, wherein said wavelength conversion layer coats at least a portion of the inside surfaces of said light-recycling envelope.

21. An illumination system as in claim 1, wherein said wavelength conversion layer coats at least a portion of said emitting layer of said light source that emits said light of a first wavelength range.

22. An illumination system as in claim 1, wherein said light-recycling envelope is constructed from a bulk material that is intrinsically reflective.

23. An illumination system as in claim 1, wherein the inside surfaces of said light-recycling envelope are covered with a reflective coating.

24. An illumination system as in claim 23, wherein said reflective coating is a diffuse reflector.

25. An illumination system as in claim 23, wherein said reflective coating is a specular reflector.

26. An illumination system as in claim 23, wherein said reflective coating is a diffuse reflector that is backed by a specular reflector.

27. An illumination system as in claim 1, further comprising a reflective polarizer, wherein said reflective polarizer is located in the light output optical path, wherein said reflective polarizer is located adjacent to said at least one light output aperture of said light-recycling envelope, wherein said reflective polarizer reflects said light of a first polarization state back into said light-recycling envelope and wherein said reflective polarizer transmits said light of a second polarization state.

28. An illumination system as in claim 1, further comprising a dichroic mirror, wherein said dichroic mirror is located in the light output optical path, wherein said dichroic mirror is located adjacent to said at least one light output aperture of said light-recycling envelope, wherein said dichroic mirror reflects said light of a first wavelength range back into said light-recycling envelope and wherein said dichroic mirror transmits said light of a second wavelength range.

29. An illumination system as in claim 1, further comprising a light collimating element, wherein said light collimating element partially collimates the light exiting said at least one light output aperture.